AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraph beginning at page 1, line 5, as follows:

The present invention relates to an interference-signal removing apparatus for removing narrow-band interference signals from input signals including wide-band desired signals and the narrow-band interference signals, and particularly to an art for improving the quality of interference-removed input signals by removing only interference signals having relatively high levels from the input signals.

Please amend the paragraph beginning at page 2, line 7, as follows:

The radio LAN of IEEE 802.11 roughly uses a ~~the~~ direct diffusion (DSSS: Direct Sequence Spread Spectrum) system and a ~~the~~ frequency hopping (FHSS: Frequency Hopping Spread Spectrum) system. In accordance with the difference between these modulated waves, it is possible to regard a signal according to the DSSS mode as a wide-band signal and a signal according to the FHSS mode as a narrow-band signal. Moreover, ~~the~~ both systems perform radio communication by using the same frequency band and systematically allow mutual interference. Therefore, it is a matter of course that interference occurs between signals according to ~~the~~ both systems.

Please amend the paragraph beginning at page 4, line 4, as follows:

Moreover, the probability that a signal according to the DSSS mode receives ~~an~~ interference is raised because it has been ~~is~~ started to widely use a ~~the~~ standard such as Bluetooth (short-range mobile service) using, for example, the FHSS mode as the radio interface between portable units.

Please amend the paragraph beginning at page 4, line 9, as follows:

Moreover, as another example, it is considered that an interference in an adjacent frequency band occurs between a communication signal according to the W-CDMA (Wideband-Code Division Multiple Access) mode and a communication signal according to the PHS

(Personal Handyphone System) mode, an interference occurs between a wide-band signal of 2.4-Ghz-band radio LAN (IEEE 80.2 11) and a narrow-band signal of Bluetooth, or an interference occurs between a CDMA-mode communication signal and a TDMA (Time Division Multiple Access) mode or FDMA (Frequency Division Multiple Access) mode communication signal due to common use of a frequency band, and an interference with an unexpected external wave and the like.

Please amend the paragraph beginning at page 5, line 11, as follows:

Next ~~Then~~, a conventional interference-signal removing apparatus will be described below. The interference-signal removing apparatus is set to, for example, a receiver for performing radio communication to remove an interference signal included in a signal received from the receiver.

Please amend the paragraph beginning at page 6, line 20, as follows:

Next ~~Then~~, examples of CDMA mode and interference-signal removing apparatuses according to the CDMA mode will be described below.

Please amend the paragraph beginning at page 9, line 9, as follows:

Referring to Figs. 20 to 24, the interference-signal removing apparatus (interference removing circuit) disclosed in the official gazette of Japanese Patent Application No. 11-197296 will be described below by referring to Figs. 11 to 15. The interference-signal removing apparatus disclosed in the official gazette is set to a base-station system, a mobile-station system, or a relay-station system using the CDMA mode to remove narrow-band interference signals from reception signals including wide-band diffusion signals diffused and modulated in accordance with the CDMA mode and the narrow-band interference signals or I and Q components of the reception signal, and more particularly, removes the interference signal by using the characteristic of the diffusion signal.

Please amend the paragraph beginning at page 13, line 1, as follows:

The above signals r1 to rn are input to the multipliers J1 and Jn and, moreover, tape-coefficient control signals h1 to hn are input to the multipliers J1 to Jn from a filter-tap-coefficient-operation control section 154 to be described later one to one. The multipliers J1 to Jn multiply two input signals (that is, weight the signals r1 to rn with the tap-coefficient control signals h1 to hn) and output the multiplication results to the adders K1 to Kn.

Please amend the paragraph beginning at page 16, line 23, as follows:

Next ~~Then~~, a case will be described below in which the above LMS algorithm is applied to this embodiment.

Please amend the paragraph beginning at page 17, line 5, as follows:

Moreover, this embodiment uses a signal (shown in the above expression 4) output from the subtracter 153 as the above error signal e(t), which ~~and this~~ is a feature of the interference removing circuit of this embodiment and ~~the~~ processing different from the normal LMS algorithm is performed.

Please amend the paragraph beginning at page 19, line 11, as follows:

Though Fig. 20 shows a configuration for preventing a signal output from the subtracter 153 from being delayed, it is also possible to obtain the same advantage as ~~the above~~ mentioned above by a configuration for delaying a reception signal input to the subtracter 163 by the delay element 161 while preventing a reception signal input to the adaptive filter 162 or filter-tap-coefficient-operation control section 164 from being delayed as shown in Fig. 22. The configuration shown in Fig. 22 is almost the same as the configuration shown in Fig. 20 expect that the delay element 161 is set to the subtracter 163.

Please amend the paragraph beginning at page 19, line 22, as follows:

Moreover, it is possible to obtain the same interference removal effect ~~same~~ as ~~the above~~ mentioned above by using an algorithm other than the above LMS algorithm. For example, a specific update expression when using the RLS algorithm in the configuration shown in Fig. 20 will be described below. In the description below, objects corresponding to the above u(t), h(t), e(t), and d(t) are shown by the same symbols for convenience~~'~~ sake of description.

Please amend the paragraph beginning at page 30, line 24, as follows:

Similarly to the case of performing description by referring to Fig. 20, Fig. 23 shows a configuration for preventing signals output from the subtracters 175a and 175b from delaying. However, as shown in Fig. 24, for example, it is possible to obtain the same advantage as described ~~the~~ above by a configuration for delaying reception signals input to subtracters 185a and 185b by delay elements 181a and 181b while preventing reception signals input to adaptive filters 182a, 182b, 183a, and 183b and a filter-tap-coefficient-operation control section 186 from delaying. In this case, the configuration shown in Fig. 24 is almost the same as the configuration shown in Fig. 23 except that the delay elements 181a and 181b are provided for the subtracters 185a and 185b, and adders 184a and 184b are also provided together with the above components.

Please amend the paragraph beginning at page 31, line 12, as follows:

Moreover, similarly to the case of performing description by referring to Fig. 20, it is possible to obtain the same interference removal effect ~~same~~ as described ~~the~~ above ~~described~~ by using an algorithm other than the above-described LMS algorithm for complex operation. As an example, the case of using the RLS algorithm for complex operation for the configuration shown in Fig. 23 will be described below. For convenience~~'~~ sake of description, objects corresponding to the above uI(t), uQ(t), hI(t), hQ(t), eQ(t), rI(t), and rQ(t) are provided with same symbols.

Please amend the paragraph beginning at page 34, line 10, as follows:

Next ~~Then~~, the state of removing interference by the above conventional interference-signal removing apparatus is specifically described below.

Please amend the paragraph beginning at page 37, line 11, as follows:

Moreover, Fig. 29 shows cases of using a CDMA signal as a wide-band desired signal and an FSK (Frequency Shift Keying) signal as a narrow-band interference signal and a case in which an ~~a~~ interference signal is one wave. Moreover, the abscissa of the graph in Fig. 29 denotes D/U {(power of desired input signal)/(power of narrow-band interference signal) per interference signal [dB] and the ordinate denotes bit error ratio of a receiver.

Please amend the paragraph beginning at page 38, line 3, as follows:

The ~~A reason~~ same as described ~~the~~ above is considered for the above deterioration. That is, it is considered that the interference-signal removing apparatus extracts not only an interference signal but also the frequency component of a wide-band desired signal when removing the above extraction result from reception signals. Moreover, it is considered that when removing no narrow-band interference signal, the characteristic is improved by the interference-signal suppression effect, compared to the case of removing narrow-band interference signals.

Please amend the paragraph beginning at page 41, line 6, as follows:

Moreover, when a diversity receiver in which the above interference-signal removing apparatus is built is used as a receiver, the same problems ~~same~~ as ~~the above~~ mentioned above may occur.

Please amend the paragraph beginning at page 41, line 20, as follows:

To achieve the above object, an interference-signal removing apparatus of the present invention removes only interference signals having a level exceeding a predetermined threshold when removing narrow-band interference signals from input signals including wide-band desired signals and the narrow-band interference signals.

Please amend the paragraph beginning at page 69, line 7, as follows:

Moreover, the interference-signal removing apparatus of this embodiment makes it possible to properly remove interference signals from wide-band frequency signals even when a plurality of narrow-band interference signals included in wide-band signals are superimposed and received, and more particularly, makes it possible to prevent wide-band signals located at an adjacent channel of the interference signal from being removed.

Please amend the paragraph beginning at page 71, line 22, as follows:

Fig. 2 shows an interference-signal removing apparatus of the present invention that is provided with an interference-signal-power estimation section 11, noise-generation ~~nose-generation~~
circuit 12, an addition circuit 13, an interference-signal-power estimation section 14, an interference-signal extraction section 15, and a synthesizer 16. In the case of this interference-signal removing apparatus, a reception signal r(t) in which a wide-band desired signal is synthesized with a plurality of narrow-band interference signals is input to the interference-signal-power estimation section 11, addition circuit 13, and synthesizer 16 as an input signal. Symbol t denotes time.

Please amend the paragraph beginning at page 75, line 15, as follows:

Therefore, the interference-signal removing apparatus of this embodiment makes it possible to obtain the same advantage as the first embodiment by the configuration of adding noises to the reception signal r(t). Specifically, the interference-signal removing apparatus of this embodiment removes interference correspondingly to the power of an interference signal, controls noises added to the reception signal r(t) at portions relating to estimation and extraction of an interference signal, and thereby buries a signal not reaching a specified level in noises. Thus, it is possible to prevent the signal from being estimated and extracted as an interference signal.

Please amend the paragraph beginning at page 85, line 4, as follows:

In this case, the word-length restriction section 32 restricts the effective word length of the reception signal r(t) by assuming the reception signal r(t) as digital-value data. Specifically, to restrict the word length of data, for example, when the reception signal r(t) is ~~16-bid~~ 16-bit data and the effective word length of a wide-band signal in the data is equivalent to 6 bits, the section 32 applies word-length restriction to low-order 7 bits of the 16-bit data to use high-order 9 bits of the data as a word-length-restricted reception signal w(t). Moreover, as another example, when the reception signal r(t) is 16-bit data and the effective word length of a wide-band signal in the data is equivalent to 4 bits, the section 32 applies word-length restriction to low-order 5 bits of the 16-bit data to use high-order 11 bits of the data as a word-length-restricted reception signal w(t).

Please amend the paragraph beginning at page 92, line 1, as follows:

The addition circuit 43 synthesizes an input reception signal r(t) with noises input from the noise generation circuit 42 and outputs the above synthesis result to the interference-signal estimation section 44 as a ~~an~~ noise-added reception signal w(t).

Please amend the paragraph beginning at page 102, line 4, as follows:

Next ~~Then~~, an interference-signal removing apparatus of a seventh embodiment of the present invention will be described below by referring to the accompanying drawings.

Please amend the paragraph beginning at page 108, line 1, as follows:

As described above, the interference-signal removing apparatus of this embodiment makes it possible to obtain the same advantage as the case of the seventh embodiment by using a configuration of adding noises having a previously-fixedly-set level to a reception signal r(t) ~~t(t)~~.

Please amend the paragraph beginning at page 108, line 22, as follows:

Next ~~Then~~, a diversity reception system of an embodiment of the present invention will be described below by referring to the accompanying drawings.

Please amend the paragraph beginning at page 113, line 3, as follows:

Moreover, the diversity reception system of this embodiment turns on/off the interference-signal removing apparatuses 81 and 82 in accordance with a result of comparing the reception signals 1 and 2 input to the interference-signal removing apparatuses 81 and 82 with a predetermined threshold. Specifically, when the power of the reception signal 1 or 2 exceeds the threshold, the diversity reception system operates the interference-signal removing apparatus 81 or 82 corresponding to the reception signal 1 or 2 to remove interference. It is permitted to use an optional value as the threshold. Moreover, though this embodiment turns on/off the interference-signal removing apparatuses 81 and 82 in accordance with power levels of the reception signals 1 and 2, it is also permitted to use <u>another</u> ~~other~~ level such as the level of amplitude as a signal level.

Please amend the paragraph beginning at page 113, line 19, as follows:

Therefore, the diversity reception system of this embodiment can further improve characteristics by independently turning on/off the interference-signal removing apparatuses 81 and 82 every reception input of each branch even under a condition in which characteristics are rather improved by not removing interference when the power of a wide-band desired signal is equal to or larger than that of a narrow-band interference signal, for example, as shown by the characteristic examples in Fig. 29. Thereby, also when the power of a narrow-band interference signal is equal to or smaller than that of a wide-band signal, it is possible to realize interference removal for minimizing deterioration of communication quality. Particularly, it is effective to apply the above configuration to diversity reception like the case of this embodiment. Thus, it is possible to further improve characteristics ~~than ever~~ by effectively using an interference-signal removing apparatus for the diversity reception system of this embodiment.

Please amend the paragraph beginning at page 116, line 11, as follows:

<u>Next</u> ~~Then~~, a diversity reception system of a tenth embodiment of the present invention will be described below by referring to the accompanying drawings.

Please amend the paragraph beginning at page 119, line 20, as follows:

Next ~~Then~~, a diversity reception system of an eleventh embodiment of the present invention will be described below by referring to the accompanying drawings.

Please amend the paragraph beginning at page 123, line 22, as follows:

Next ~~Then~~, a diversity reception system of a twelfth embodiment of the present invention will be described below by referring to the accompanying drawings.

Please amend the paragraph beginning at page 126, line 1, as follows:

Next ~~Then~~, a diversity reception system of a thirteenth embodiment of the present invention will be described below by referring to the accompanying drawings.

Please amend the paragraph beginning at page 126, line 23, as follows:

When the interference-signal removing apparatus 121 is turned on by the power comparator 122, it removes interference from the input reception signal 2 and outputs the interference -removed reception signal 2 to the diversity receiver 123. When the ~~second~~ interference-signal removing apparatus 121 is turned off, it directly outputs the input reception signal 2 to the diversity receiver 123.

Please amend the paragraph beginning at page 129, line 1, as follows:

Next ~~Then~~, a diversity reception system of a fourteenth embodiment of the present invention will be described below by referring to the accompanying drawings.

Please amend the paragraph beginning at page 129, line 24, as follows:

When the interference-signal removing apparatus 131 is turned on by the power comparator 132, it removes interference from the input reception signal 2 and outputs the interference-removed reception signal 2 to the diversity receiver 132. When the apparatus 131 is turned off, the ~~second~~ interference-signal removing apparatus 131 directly outputs the input reception signal 2 to the diversity receiver 133.

Please amend the paragraph beginning at page 130, line 5, as follows:

The power comparator 132 compares the power of the input reception signal 1 and that of the input reception signal 2 with a predetermined threshold. When either or both of the power of the reception signal 1 and that of the reception signal 2 exceeds (or exceed) the threshold, the comparator 132 turns on the interference-signal removing apparatus 131 ~~132~~ to remove interference from the reception signal 2. When both of the power of the reception signal 1 and that of the reception signal 2 are equal to or less than the threshold (when neither signal 1 nor 2 exceeds the threshold), the comparator 132 turns off the interference-signal removing apparatus 131 ~~132~~ and directly outputs the reception signal 2. That is, when the power of at least either of the reception signals 1 and 2 exceeds the threshold, the comparator 132 regards that an interference signal is present and operates the interference-signal removing apparatus 131 ~~132~~ to remove interference.